REMARKS

In the Office Action mailed March 2, 2006, claims 1-10, 12-21 and 23-29 were pending. Claims 1, 2, 4, 5, 9, 12-14, 18-20, 23, 24 and 26-29 were rejected under 35 U.S.C. §103(a) as being obvious over Erpelding et al. (U.S. Pat. No. 4,996,623) in view of Suzuki (U.S. Pat. No. 5,644,448) in further view of Dockerty et al. (U.S. Pat. No. 5,796,169) and/or Lemke et al. (U.S. Pat. No. 6,024,584). Claims 1-3, 5, 6, 8, 9, 12-17, 19, 20, 24, 25, 27 and 29 were rejected under 35 U.S.C. §103(a) as being obvious over Endo et al. (U.S. Pat. No. 5,864,446) in view of Suzuki, in further view of Dockerty et al. and/or Lemke et al. Claim 10 was rejected under 35 U.S.C. §103(a) as being obvious over Endo et al. Claims 7 and 21 were objected to as being dependent upon a rejected base claim, but were indicted to be allowable if re-written in independent form.

Claim Objections

Claim 7 was objected to as being dependent upon a rejected base claim, but was indicted to be allowable if re-written in independent form. With the present amendment, claim 1 has been amended to incorporate all of the limitations of former dependent claims 6 and 7 (both now canceled). Because amended claim 1 now contains all of the limitations of former dependent claim 7, which was indicated to be allowable over the art of record, claim 1 is now in condition for allowance. Notification to that effect is requested. Furthermore, claims 2-5 and 8-10 depend from amended independent claim 1, and contain all of the limitations of that base claim. Therefore, dependent claims 2-5 and 8-10 are also in condition for allowance.

Claim 21 was objected to as being dependent upon a rejected base claim, but was indicted to be allowable if re-written in independent form. With the present amendment, claim 12 has been amended to incorporate all of the limitations of former dependent claims 19 and 21 (both now canceled). Because amended claim 12 now contains all of the limitations of former dependent claim 21, which was indicated to be allowable over the art of record, claim 12 is now in condition for allowance. Notification to that effect is requested. Furthermore, claims 13-18 and 20 depend from amended independent claim 12, and contain all of the limitations of that base claim. Therefore, dependent claims 13-18 and 20 are also in condition for allowance.

Rejections - 35 U.S.C. §103(a)

Claims 1, 2, 4, 5, 9, 12-14, 18-20, 23, 24 and 26-29 were rejected under 35 U.S.C. §103(a) as being obvious over Erpelding et al. (U.S. Pat. No. 4,996,623) in view of Suzuki (U.S. Pat. No. 5,644,448) in further view of Dockerty et al. (U.S. Pat. No. 5,796,169) and/or Lemke et al. (U.S. Pat. No. 6,024,584). With this Amendment, claim 19 has been canceled and independent claims 1 and 12 have been amended to include the limitations of dependent claims 7 and 21, respectively, which were indicated to be allowable. Therefore, for the reasons discussed above, the rejections of claims 1-5, 8-10, 12-14 and 18-20 under §103 are therefore moot, and should be withdrawn. Notification to that effect is requested.

Independent claim 23 relates to an assembly for mechanically and electrically linking an actuator arm with a slider supporting a read/write head proximate a rotating disc. The assembly according to independent claim 23 requires a multi-layer substrate having an attachment region for attachment to an actuator arm and an interconnect path terminating at the attachment region at a connection point to provide an electro-mechanical attachment to the actuator arm, where the electro-mechanical connection is the only connection between the multi-layer laminate substrate and the actuator arm.

Amended independent claim 29 relates to a data storage device that requires an actuator arm assembly and an integrated suspension assembly including an attachment region having multiple electro-mechanical connection points that collectively provide a mechanical attachment to the actuator arm assembly and electrical connections to the actuator arm assembly without additional mechanical or electrical connections therebetween.

Erpelding et al. discloses a laminated suspension assembly 60, 62 that can be mechanically attached to an actuator (or suspension) arm 60 by conventional techniques, such as using machine screws, laser welding or epoxy bonding. (Erpelding et al., col. 5, ll. 17-28). Electrical connections between the laminated suspension and the actuator arm are not specifically disclosed by Erpelding et al. However, the conventional mechanical attachments disclosed by

Erpelding et al. would not create electrical connections, and thus are not electro-mechanical connections. (March 2, 2006 Office Action p. 3).

Suzuki discloses a head suspension assembly that includes actuator arms 30, suspensions 34 having electrical terminals 37, main flexible printed circuit sheets (FPCs) 42, and interconnection FPCs 44 having terminals 47. (Suzuki col. 4, ll. 1-5, 27-33 and 56-65; col. 5, ll. 1-12; FIGS. 2-9). Although not denoted by a reference number, FIGS. 2 and 5 of Suzuki shows that the suspensions 34 are secured to the actuator arms 30 by conventional mechanical means, apparently using a swage hole. Indeed, Suzuki shows three of the four illustrated suspensions 34 being supported by the corresponding actuator arms 30 without any connections (electrical or mechanical) at the electrical terminals 37. The last of the illustrated suspensions 34 appear to be mechanically secured to its corresponding actuator arm 30 in the same manner, only with an additional electrical connection to interconnection FPC 44. Thus, Suzuki discloses the use of conventional mechanical connections between the suspensions 34 and the actuator arms 30 that are separate and distinct from the electrical connections between terminals 37 and 47 (of the suspension 34 and the interconnection FPC 44, respectively).

Dockerty et al. discloses solder patterns used from making electrical connections in integrated circuit devices, but does not relate to the design or manufacture of head suspension assemblies.

Lemke et al. discloses a plug-and-receptacle type electrical connector for use in manufacture of printed circuit boards, but does not relate to head suspension assemblies.

The cited references do not make obvious independent claims 23 or 29. There is no suggestion in the prior art to modify the structures of Erpelding et al. and/or Suzuki to eliminate the conventional mechanical connections. Therefore, there is no motivation to combine either Dockerty et al. or Lemke et al. with the other cited references (Erpelding et al. and Suzuki). To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000); MPEP 4143.01 and 4143.03. Rejections

under 35 U.S.C. §103 must also rest on a factual basis. In making such a rejection, the examiner has the initial duty of supplying the requisite factual basis, and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. *In re Warner*, 37 F.2d 1011, 1017 (CCPA 1967), *cert denied*, 389 U.S. 1057 (1968).

Here, there is no motivation to modify the Erpelding et al. or Suzuki references to utilize *only* electro-mechanical connections between the suspension (or load beam or multi-layer laminate substrate) and the actuator arm as required by amended independent claims 23 and 29. In other words, there is no motivation found within Erpelding et al. or Suzuki to eliminate conventional mechanical attachments used by both Erpelding et al. and Suzuki in addition to soldered electrical connections.

As acknowledged in the March 2, 2006 Office Action, Erpelding et al. does not show, teach or disclose each and every element of independent claims 23 or 29, and, as acknowledged on page 3 of the March 2, 2006 Office Action, does not disclose the use of any electro-magnetic connections. Erpelding et al. does not suggest eliminating the purely mechanical connections between the suspension 62, 64 and the support arms 60, which are the only connections between those components disclosed by Erpelding et al.

Moreover, Suzuki also fails to show, teach or disclose components of head suspension assemblies compatible with the use of *only* electro-mechanical connections. As explained above, Suzuki utilizes conventional mechanical attachments and separate electrical connections. The use of only electro-magnetic connections to *flexible* interconnection structures (e.g., FPCs 42 and 44 of Suzuki) would not be reasonably expected to provide suitable structural support to head suspension assemblies, which are movable parts. Thus, regardless of whether or not conventional electrical solder connections provide structural support, the use of electro-mechanical connections to make a connection between a suspension (or load beam or multi-layer laminate substrate) and an actuator arm is not suitable for providing the sole source of structural support therebetween with Suzuki.

In addition, Dockerty et al. and Lemke et al. relate to non-analogous arts, and those of ordinary skill in the relevant art would not have known to modify the Erpelding et al. and Suzuki references according to teachings of Dockerty et al. or Lemke et al. Dockerty et al. and Lemke et al. both relate to the assembly of printed circuit boards. In contrast, Erpelding et al. and Suzuki relate to the art of head suspension assembly design and assembly.

Thus, there is no motivation to combine the Dockerty et al. or Lemke et al. references with either Erpelding et al. or Suzuki. The rejections of amended independent claims 23 and 29 should accordingly be withdrawn. Notification to that effect is requested. Moreover, claims 24 and 26-28 depend from amended independent claim 23 and include all of the limitations of that base claim. Therefore, dependent claims 24 and 26-28 are allowable for the reasons discussed above with respect to amended independent claim 23.

Claims 1-3, 5, 6, 8, 9, 12-17, 19, 20, 24, 25, 27 and 29 were rejected under 35 U.S.C. §103(a) as being obvious over Endo et al. (U.S. Pat. No. 5,864,446) in view of Suzuki, in further view of Dockerty et al. and/or Lemke et al. With this Amendment, claims 6 and 19 have been canceled and independent claims 1 and 12 have been amended to include the limitations of dependent claims 7 and 21, respectively, which were indicated to be allowable. Therefore, for the reasons discussed above, the rejections of claims 1-3, 5, 6, 8, 9, 12-17, 19 and 20 under §103 are therefore moot, and should be withdrawn. Notification to that effect is requested.

Endo et al. discloses a multi-layer head assembly 41 that includes an attaching hole 45a and a number of interconnect pads or nodes 47_1-47_4. (Endo et al., col. 4, ll. 50-58; FIGS. 6A and 6B). Endo et al. describes a conventional swaged attachment of the head assembly 41 to an actuator arm or carriage arm 40, where a ball 62 is passed through the attaching hole 45a of the head assembly 41 to mechanically deform a portion of the head assembly 41 to secure it to the carriage arm 40. (Endo et al., col. 7, ll. 1-6; FIGS. 10A and 10B). In addition, Endo et al. discloses a glued (i.e., adhesive) attachment of the head assembly 41 and carriage arm 40, where the glue is separated from the interconnect traces or signal conducting pattern 47 by the protection cover 46. (Endo et al., col. 7, ll. 12-20). As acknowledged on page 5 of the March 2, 2006 Office Action, Endo et al. does

not disclose electro-mechanical connections between the head assembly 41 and the carriage arm 40.

The relevant disclosures of Suzuki, Dockerty et al. and Lemke et al. are discussed above.

The cited references do not make obvious independent claims 23 and 29. There is no suggestion in the prior art to modify the structures of Endo et al. and/or Suzuki to eliminate the conventional mechanical connections and utilize *only* electro-mechanical connections between the suspension (or load beam or multi-layer laminate substrate) and the actuator arm, as required by amended independent claims 23 and 29.

As acknowledged in the March 2, 2006 Office Action, Endo et al. does not show, teach or disclose each and every element of independent claims 23 and 29, and does not disclose the use of any electro-magnetic connections. Moreover, Endo et al. does not suggest eliminating the purely mechanical connections between the head assembly 41 and the carriage arm 40, which are the only connections between those components disclosed by Endo et al.

Also, for the same reasons as discussed above, Suzuki fails to provide a motivation to modify its teachings to provide solely electro-mechanical connections.

In addition, Dockerty et al. and Lemke et al. relate to non-analogous arts, and those of ordinary skill in the relevant art would not have known to modify the Endo et al. and Suzuki references according to teachings of Dockerty et al. or Lemke et al. Dockerty et al. and Lemke et al. both relate to the assembly of printed circuit boards. In contrast, Endo et al. and Suzuki relate to the art of head suspension assembly design and assembly.

Thus, there is no motivation to combine the Dockerty et al. or Lemke et al. references with either Endo et al. or Suzuki. The rejections of amended independent claims 23 and 29 should accordingly be withdrawn. Notification to that effect is requested. Moreover, claims 24, 25 and 27 depend from amended independent claim 23 and include all of the limitations of that base claim. Therefore, dependent claims 24, 25 and 27 are allowable for the reasons discussed above with respect to amended independent claim 23.

Claim 10 was rejected under 35 U.S.C. §103(a) as being obvious over Endo et al. As discussed above, independent claim 1 has been amended to include the limitations of dependent claim 7, which was indicated to be allowable. Claim 10 depends from amended independent claim 1, and includes all of limitations of that base claim. It is therefore submitted that the rejection of dependent claim 10 is moot. Notification to that effect is requested.

In addition, as stated in the December 16, 2005 Amendment and above, the glue disclosed by Endo et al. is separated from the interconnect traces or signal conducting pattern 47 by the protection cover 46. (Endo et al., col. 7, ll. 12-20).[1] Endo et al. thus specifically teaches away from placing glue in contact with the interconnect traces or signal conducting pattern 47. Therefore, Endo et al. also teaches away from the use of electro-mechanical connections using conductive glue in contact with the interconnect traces or conducting pattern 47 as required by claim 10. Because Endo et al. teaches away from the present invention as defined by claim 10, there is no motivation for the suggested modification. This provides another reason why the rejection under §103 should be withdrawn.

[1]While it is acknowledged that conductive adhesive may be used for grounding purposes, it was submitted in the December 16, 2005 Amendment that "teachings related to grounding are not directly applicable, because a single grounding connection would not contemplate electrical connections at a plurality of interconnect pads, which must be isolated from each other to prevent shorting the circuit(s)."

CONCLUSION

Upon review of the cited art, Applicant believes that all of the pending claims patentably define the invention over all of the cited art. Applicant believes the above amendments and remarks place all pending claims in allowable form and respectfully requests a Notice of Allowance.

The Commissioner is authorized to charge payment of any additional fees associated with this paper or credit any overpayment to Deposit Account No. 11-0982.

Respectfully submitted,
KINNEY & LANGE, P.A.

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